

What is claimed is:

1. A toner container storing powdery toner to be replenished via a toner outlet thereof, said toner container comprising:

a container body; and

shutter means positioned in the toner outlet for selectively opening or closing said toner outlet;

said shutter means comprising an opening/closing member, a resilient member constantly biasing said opening/closing member from an inside toward an outside of said container body, and a support member⁽³⁾ supporting said resilient member and said opening/closing member.

2. The toner container as claimed in claim 1, wherein said resilient member constantly biases said opening/closing member from an opening position toward a closing position, said shutter means further comprising stop means for maintaining said opening/closing member in said closing position.

3. The toner container as claimed in claim 2, wherein said support member is formed with a through hole communicating the inside and the outside of said container body and closed, when said opening/closing member is in said closing position, by said opening/closing member and a seal member contacting a circumference of said opening/closing member.

4. The toner container as claimed in claim 3, wherein said through hole comprises a larger diameter portion and a smaller diameter portion, said seal member being adhered to a wall of said larger diameter portion.

5. The toner container as claimed in claim 4, wherein a gap of 0.2 mm or above exists between an outside diameter of said opening/closing member and said smaller diameter portion.

6. The toner container as claimed in claim 3, wherein said seal member comprises an elastic seal formed with a through hole through which said opening/closing member is capable of passing.

7. The toner container as claimed in claim 2, wherein said opening/closing member comprises a piston and a piston rod connected to said piston, said stop means comprising a claw extending radially outward from an end of said piston rod and a ring portion at which beam members extending from said support member terminate.

8. The toner container as claimed in claim 7, wherein said resilient member comprises a compression spring wound round said piston rod between said piston and said ring portion.

9. The toner container as claimed in claim 1, wherein said support member is formed with a through hole communicating the inside and the outside of said container

body and closed, when said opening/closing member is in said closing position, by said opening/closing member and a seal member contacting a circumference of said opening/closing member.

10. The toner container as claimed in claim 9, wherein said through hole comprises a larger diameter portion and a smaller diameter portion, said seal member being adhered to a wall of said larger diameter portion.

11. The toner container as claimed in claim 10, wherein a gap of 0.2 mm or above exists between an outside diameter of said opening/closing member and said smaller diameter portion.

12. The toner container as claimed in claim 9, wherein said seal member comprises an elastic seal formed with a through hole through which said opening/closing member is capable of passing.

13. A toner container storing powdery toner to be replenished via a toner outlet thereof, said toner container comprising:

a container body; and

shutter means positioned in the toner outlet for selectively opening or closing said toner outlet;

said shutter means comprising an opening/closing member, a resilient member constantly biasing said opening/closing member from an inside toward an outside

of said container body, and a support member supporting said resilient member and said opening/closing member;

wherein said opening/closing member is mounted on said support member in such a manner as to slide between an opening position for opening the toner outlet and a closing position, which is different from said opening position, for closing said toner outlet.

14. The toner container as claimed in claim 13, wherein said closing position and said opening position are respectively located at an end portion of said toner container and the inside of said toner container.

15. The toner container as claimed in claim 14, wherein said resilient member constantly biases said opening/closing member from an opening position toward a closing position, said shutter means further comprising stop means for maintaining said opening/closing member in said closing position.

16. The toner container as claimed in claim 15, wherein said support member is formed with a through hole communicating the inside and the outside of said container body and closed, when said opening/closing member is in said closing position, by said opening/closing member and a seal member contacting a circumference of said opening/closing member.

17. The toner container as claimed in claim 16,

wherein said through hole comprises a larger diameter portion and a smaller diameter portion, said seal member being adhered to a wall of said larger diameter portion.

18. The toner container as claimed in claim 17, wherein a gap of 0.2 mm or above exists between an outside diameter of said opening/closing member and said smaller diameter portion.

19. The toner container as claimed in claim 16, wherein said seal member comprises an elastic seal formed with a through hole through which said opening/closing member is capable of passing.

20. The toner container as claimed in claim 15, wherein said opening/closing member comprises a piston and a piston rod connected to said piston, said stop means comprising a claw extending radially outward from an end of said piston rod and a ring portion at which beam members extending from said support member terminate.

21. The toner container as claimed in claim 20, wherein said resilient member comprises a compression spring wound round said piston rod between said piston and said ring portion.

22. The toner container as claimed in claim 13, wherein said resilient member constantly biases said opening/closing member from an opening position toward a closing position, said shutter means further comprising

stop means for maintaining said opening/closing member in said closing position.

23. The toner container as claimed in claim 22, wherein said support member is formed with a through hole communicating the inside and the outside of said container body and closed, when said opening/closing member is in said closing position, by said opening/closing member and a seal member contacting a circumference of said opening/closing member.

24. The toner container as claimed in claim 23, wherein said through hole comprises a larger diameter portion and a smaller diameter portion, said seal member being adhered to a wall of said larger diameter portion.

25. The toner container as claimed in claim 24, wherein a gap of 0.2 mm or above exists between an outside diameter of said opening/closing member and said smaller diameter portion.

26. The toner container as claimed in claim 23, wherein said seal member comprises an elastic seal formed with a through hole through which said opening/closing member is capable of passing.

27. The toner container as claimed in claim 22, wherein said opening/closing member comprises a piston and a piston rod connected to said piston, said stop means comprising a claw extending radially outward from an end

of said piston rod and a ring portion at which beam members extending from said support member terminate.

28. The toner container as claimed in claim 27, wherein said resilient member comprises a compression spring wound round said piston rod between said piston and said ring portion.

29. The toner container as claimed in claim 13, wherein said support member is formed with a through hole communicating the inside and the outside of said container body and closed, when said opening/closing member is in said closing position, by said opening/closing member and a seal member contacting a circumference of said opening/closing member.

30. The toner container as claimed in claim 29, wherein said through hole comprises a larger diameter portion and a smaller diameter portion, said seal member being adhered to a wall of said larger diameter portion.

31. The toner container as claimed in claim 30, wherein a gap of 0.2 mm or above exists between an outside diameter of said opening/closing member and said smaller diameter portion.

32. The toner container as claimed in claim 29, wherein said seal member comprises an elastic seal formed with a through hole through which said opening/closing member is capable of passing.

33. An image forming apparatus comprising:

a setting portion for removably receiving a toner container storing powdery toner and mounted from above;

a developing device to which the toner is replenished from said toner container set in said setting portion;

a nozzle extending upward from said setting portion;

and

shutter means included in said toner container;

wherein said nozzle opens said shutter means when said toner container is set in said setting portion.

34. The apparatus as claimed in claim 33, wherein said shutter means comprises:

an opening/closing member movable to an opening position or a closing position when said nozzle is inserted into or removed from said toner container, respectively;

a resilient member constantly biasing said opening/closing member from an inside toward an outside of said container body;

a support member supporting said resilient member and said opening/closing member;

stop means for maintaining said opening/closing member at said closing position; and

a seal member contacting a circumference of said opening/closing member when said opening/closing member is in said closing position.

35. The apparatus as claimed in claim 34, wherein when said toner container is fully set in said setting portion, a tip of said nozzle protrudes into said toner container.

36. The apparatus as claimed in claim 35, wherein said opening/closing member comprises:

a piston to be pushed by said nozzle and having a same size and shape as said nozzle as seen in a section; and

a piston rod connected to said piston.

37. The apparatus as claimed in claim 36, wherein when said nozzle pushes said piston, said nozzle and said piston closely contact each other without any gap.

38. The apparatus as claimed in claim 37, wherein the tip of said nozzle is convex while an end of said piston facing said tip is concave to thereby closely contact said tip.

39. An image forming apparatus comprising:

a setting portion for removably receiving a toner container storing powder toner and mounted from above;

a developing device to which the toner is replenished from said toner container set in said setting portion;

a nozzle extending upward from said setting portion;

shutter means included in said toner container;

a resilient member constantly biasing said shutter

means from an inside toward an outside of said toner container; and

thrusting means for pushing said toner container set in said setting portion upward;

wherein said resilient member providing said thrusting means with a force for pushing said toner container upward.

40. The apparatus as claimed in claim 39, wherein said thrusting means comprises biasing means for biasing said toner container upward, and

assuming that frictional resistance F acts when said nozzle is removed from said toner container, and that said toner container has a weight of M when empty, a sum of a biasing force of said biasing force of said resilient member and a biasing force of said elastic member is greater than a sum of F and M .

41. In an image forming apparatus in which a toner container storing toner is removably set for replenishing said toner to a developing device, said toner container comprising:

a container body; and

shutter means positioned in the toner outlet for selectively opening or closing said toner outlet;

said shutter means comprising an opening/closing member, a resilient member constantly biasing said

opening/closing member from an inside toward an outside of said container body, and a support member supporting said resilient member and said opening/closing member.

42. In an image forming apparatus in which a toner container storing toner is removably set for replenishing said toner to a developing device, said toner container comprising:

a container body; and

shutter means positioned in the toner outlet for selectively opening or closing said toner outlet;

said shutter means comprising an opening/closing member, a resilient member constantly biasing said opening/closing member from an inside toward an outside of said container body, and a support member supporting said resilient member and said opening/closing member;

wherein said opening/closing member is mounted on said support member in such a manner as to slide between an opening position for opening the toner outlet and a closing position, which is different from said opening position, for closing said toner outlet.

43. A toner container storing toner and removably mounted to a body of an image forming apparatus, said toner container comprising:

a deformable container body tapered toward a toner outlet, which faces downward when said toner container is

mounted to the body of the image forming apparatus;

a passage formed in said container body and communicated to an outside;

shutter means disposed in said container body;

a resilient member disposed in said container body and constantly biasing said shutter means from an inside toward an outside of said container body; and

preventing means adjoining said shutter means for preventing the toner from staying.

44. The toner container as claimed in claim 43, wherein said preventing means comprises a flat bent member fitted on a side of said container body and bent to be convex toward the outside.

45. The toner container as claimed in claim 44, wherein said bent member is adhered to said container body.

46. The toner container as claimed in claim 45, wherein said bent member is formed of an elastic material more rigid than said container body.

47. The toner container as claimed in claim 44, wherein said bent member has rounded corners.

48. The toner container as claimed in claim 43, wherein said preventing means comprises a fold formed on a side of said container body.

49. The toner container as claimed in claim 43, wherein said container body comprises a deformable toner

bag and a rigid box covering said toner bag except for said passage, and

said preventing means comprising a magnet fitted on one of a side of said toner bag and a side of said box facing said one side of said toner bag and a magnetic member fitted on the other of said sides.

50. In an image forming apparatus in which a toner container storing toner is removably set for replenishing said toner to a developing device, said toner container comprising:

a deformable container body tapered toward a toner outlet, which faces downward when said toner container is mounted to the body of the image forming apparatus;

a passage formed in said container body and communicated to an outside;

shutter means disposed in said container body;

a resilient member disposed in said container body and constantly biasing said shutter means from an inside toward an outside of said container body; and

preventing means adjoining said shutter means for preventing the toner from staying.